**Sound and Light in the Ocean Assignment – Tips for question 1!**

* After reading over the introduction and part one (speed of sound change with depth), carefully re-examine the temperature and salinity profiles (graphs).
* Note that as ocean water temperature (T), salinity (S) and pressure (D) increase, so does sound speed (C). In other words:
  + C ∝ T (read as: sound speed is directly proportional to ocean water temperature)
  + C ∝ S (sound speed directly proportional to ocean water salinity in PSU – practical salinity unit – 1 PSU = 1g/kg (1 gram of salt per 1 kg of water))
  + C ∝ D (sound speed directly proportional to ocean water pressure)
* In this exercise, we are interested in the change of sound speed as depth increases – so the effect of increasing salinity and pressure as you move down in the water column is to increase sound speed.
* Because it gets colder as depth increases from the surface, temperature decreases the speed of sound with increasing depth – therefore the delta C-temperature values should be negative.
* Using the profiles on the front page, determine the values for delta T, S, and D by calculating the difference between the values for depths of 0 and 500m, then again between the values for depths 500m & 3500m.
* Determine the values for the change in the sound speed by multiplying the values for delta T, S, and D by their respective “effect on sound speed” values.
* Use the formula for delta C to determine the overall change in sound speed due to the three variables, and then determine the new speed of sound at the depth of 500, and 3500 using the delta C values.
* The graph should have 3 data points only – connect with straight lines.